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Egmont Kakarot-Handtke*

Abstract

When we characterize an argument that has no sound theoretical foundation as political, then what has been produced by economists so far is political economics. However, since the Classics and Marx all major economic schools have defended the claim that they were doing science. This claim has been convincingly rebutted. So, the task is still before us. The way forward is to move from behavioral to structural economics. In what we should be mostly interested are not so much the behavioral defects of economic agents but the structural defects of the market system and how to repair them.

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1 From belief to knowledge

We wish to believe that our beliefs, sometimes at least, yield *knowledge*, and a belief does not yield knowledge unless it is true. (Russel, 1961, p. 320), original emphasis

A belief is rendered true or false by relation to a fact, which may lie outside the experience of the person entertaining the belief. (Russel, 1961, p. 320)

No doubt about it, what economists have produced so far is much opinion and little knowledge. Neither Orthodoxy nor Heterodoxy has the true theory of how the actual market system works. Public discussion on all levels about economic matters therefore has no sound theoretical foundation, it is commonsensical, ad hoc, practical, political, psychological, sociological, rhetorical or whatever, but it is not scientific in the sense that it is based on something that satisfies the criteria of material and formal consistency. The main trouble with opinion is not so much whether it is right or wrong, that remains on the surface, the main trouble is that it has no scientific foundation. Since both Walrasianism and Keynesianism are failed approaches, in no discussion whatever economists can claim the authority of science. There is no way around this:

In order to tell the politicians and practitioners something about causes and best means, the economist needs the true theory or else he has not much more to offer than educated common sense or his personal opinion. (Stigum, 1991, p. 30)

Economists have often convincing arguments but they have no true theory. Why this is so seems to be an interesting question – it really is – but it is not an urgent question. The urgent question is how to get out of the cul-de-sac.

No thinking economist can confidently subscribe to optimizing and equilibrating Orthodoxy. That is all a bit far-fetched and ended unhappy in general equilibrium theory. Unfortunately, traditional Heterodoxy is only moderately attractive because after thoroughly debunking Orthodoxy not much in the way of a constructive alternative has been developed. And to aim at more pluralism, which means in plain words the peaceful coexistence of false theories, amounts to an exodus from science.

When we characterize an argument that has no sound theoretical foundation as political, then what has been produced by economists so far is political economics. However, since the Classics and Marx all major economic schools have defended the claim that they were doing science. This claim has been convincingly rebutted. So, the task is still before us. The way forward is to move the center of gravity of economic thinking from political to theoretical economics as summarized in Figure 1.

Center of gravity	Political econ		Theoretical econ
Constructive Heterodoxy		↗	Z
Traditional Heterodoxy	Y		
Orthodoxy	X		

Figure 1: Moving from proto-scientific to scientific economics

What has kept economics firmly in the realm of political economics is the focus on human behavior. Most economists cannot get their head around the fact that economics is not a science of behavior (Hudík, 2011). What they are fond of talking about belongs especially to the realms of sociology, psychology, anthropology, moral philosophy, information theory, law, history, etcetera. Economists show up in every domain — except economics.

In marked contrast, theoretical economics deals exclusively with the systemic behavior of the actual monetary economy. Theoretical economics is objective. There are systemic laws but there is no such thing as behavioral laws. Systemic laws, for instance the Profit Law, have the same methodological status as physical laws. The Profit Law holds always and everywhere. The economist's task is to find these systemic laws and this implies to leave all speculations about human behavior to political and societal gossip.

Does the world expect from economists to find out how people behave? No, this is the proper job of psychology, sociology, etcetera. Does the world expect from economists to figure out what profit is? Yes, of course, no philosopher, physicist, biologist, or sociologist will ever try to figure this out. Have economists done their proper job? No: "... one of the most convoluted and muddled areas in economic theory: the theory of profit." (Mirowski, 1986, p. 234).

The first task of every science is to get the fundamentals right. Conventional economics rests on behavioral assumptions that are formally expressed as axioms (McKenzie, 2008). But no way leads from such premises to an explanation of how the actual market economy works. Axioms are indispensable to build up a theory that epitomizes formal and material consistency. The fatal flaw of the standard approach is that it starts from the wrong set of premises.

The logical consequence of the present paper is to discard the subjective-behavioral axioms and to take objective-structural axioms as the formal point of departure. This is the precondition for approaching any economic problem whatsoever with a fair chance of solving it. In what we should be really interested are not so much the behavioral defects of economic agents like greed or moral hazard and how to better them, but the structural defects of the market system and how to repair them.

Section 2 first provides the correct formal foundations with the set of four structural axioms. These minimalistic premises underlay the whole analysis of structural defects. Section 3 deals with the price mechanism, Section 4 with the profit mechanism, Section 5 with the stochastic phenomenon of structural stress, Section 6 with

how inefficiency emerges and prevails indefinitely, Section 7 with how the monetary order is properly institutionalized, Section 8 with why the market system is literally doomed to growth, Section 9 with the lack of forces that move the labor market toward full employment, and finally Section 10 with distribution and its built-in tendency to wealth concentration. Section 11 concludes.

2 The framework of primitive concepts

Once the economist decides on the mathematical framework in which to formulate his theories, he can then let the framework guide him in the choice of the economically relevant quantities and relations. He thereby relies on the possibility that the mathematics has captured more of the economics than he had consciously intended. He lets the formalism do the work for him. (Zahar, 1980, p. 32) with ‘economist’ substituted for ‘physicist’

A theory is the articulated mental representation of the real thing. Theory and real thing are different but correspond at crucial touch points. Abstract analysis must eventually arrive with the highest precision at concrete facts. The correct theory describes the real reality. Objective reality is different from the subjective reality of the commonsensical individual. Because of the great number of domains the individual can seldom rise above opinion except in his field of specialization. Opinion may have a social value but is scientifically worthless because of logical or factual defects. Most opinions deal with nonentities. Valid theories incorporate knowledge of different scope. Economics deals with the world economy as a subdomain of the world society. In very general terms, economics deals with a hybrid system-human entity. For good methodological reasons the analysis starts with the objective systemic relationships and not with some plausible behavioral assumption. Plausibility is not a firm enough foundation in any science.

2.1 Axioms

The new formal foundations of theoretical economics define the interdependencies of the real and nominal variables that constitute the monetary economy.

The first three structural axioms relate to income, production, and expenditure in a period of arbitrary length. The period length is conveniently assumed to be the calendar year. Simplicity demands that we have for the beginning one world economy, one firm, and one product. Axiomatization is about ascertaining the *minimum* number of premises.

Total income of the household sector Y in period t is the sum of wage income, i.e. the product of wage rate W and working hours L , and distributed profit, i.e. the

product of dividend D and the number of shares N . Nothing is implied at this stage about who owns the shares.

$$Y = WL + DN \quad (1)$$

The period counter t runs from 0, the initial period, to ∞ . An anchoring in historical time is possible but not necessary at the very beginning of the analysis.

Output of the business sector O is the product of productivity R and working hours.

$$O = RL \quad (2)$$

The productivity R depends on the underlying production process. The 2nd axiom should therefore not be misinterpreted as a linear production function. Geometrically the 2nd axiom is a ray from the coordinate origin that tracks underlying discontinuous nonlinearities; it does not contain any implicit assumption about increasing or decreasing returns.

Consumption expenditures C of the household sector is the product of price P and quantity bought X .

$$C = PX \quad (3)$$

The axioms represent the pure consumption economy, that is, no investment, no foreign trade, and no government.

The period values of the axiomatic variables are formally connected by the familiar growth equation, which is added as the 4th axiom.

$$\begin{aligned} Z_t &= Z_{t-1} \left(1 + \ddot{Z}_t \right) \\ &\text{or} \\ Z_t &= Z_0 (1 + \ddot{Z}_1) (1 + \ddot{Z}_2) \dots (1 + \ddot{Z}_t) = Z_0 \prod_{i=1}^t (1 + \ddot{Z}_i). \end{aligned} \quad (4)$$

with

$$Z \leftarrow W, L, D, N, R, P, X, \dots$$

The path of the representative variable Z_t is determined by the initial value Z_0 and the rates of change \ddot{Z}_t for each period. Each path has three segments: past, present, future. The past rates of change are known and can be inserted in (4). The axioms contain the minimum number of variables. Seven of the variables are elementary, three are composed. Figure 2 is the graphical representation of the first four axioms.

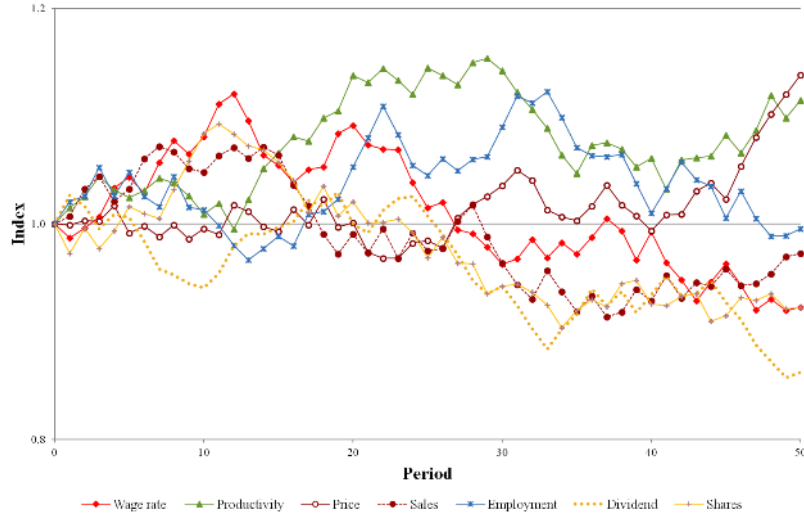


Figure 2: The pure consumption economy: paths of the seven elementary axiomatic variables W, L, D, N, R, P, X from the initial period $t = 0$ until period $t = 50$ as defined by independent symmetrical random rates of change. In order to neutralize the different dimensions, all paths are numerically expressed in terms of their respective initial values, therefore they start collectively at the index point 1.

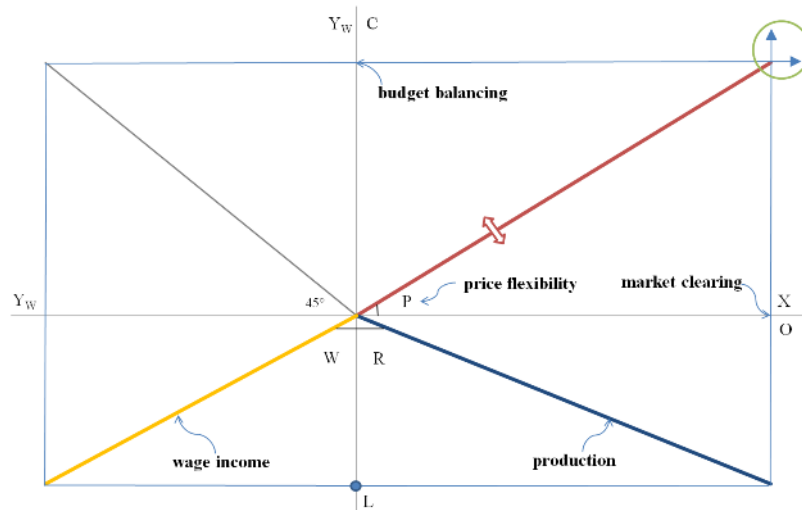


Figure 3: Single period view of the pure consumption economy with market clearing, budget balancing and conditional price flexibility. All elementary variables from Figure 2 reappear here, except D and N .

2.2 The period view

Figure 3 shows a cross-section of Figure 2 for an arbitrary period t . The pure consumption economy has the following properties.

At any given level of employment L , the wage income that is generated in the consolidated business sector follows by multiplication with the wage rate. On the real side, output follows by multiplication with the productivity. Finally, the price follows as the dependent variable under the conditions of budget balancing, i.e. $C = Y_W$ and market clearing, i.e. $X = O$. Note that the ray in the southeastern quadrant is *not* a linear production function; the ray tracks *any* underlying production function. Note also that it is methodologically inadmissible to take the assumption of decreasing returns into the premises. Note finally that W is the *average* wage rate if the individual wage rates are different among the employees, which is normally the case.

For the time being distributed profit DN in the 1st axiom has been set to zero.

If the wage rate W is lowered, the market clearing price P falls. If the number of working hours L is increased the price remains constant, provided productivity R does not change. If productivity decreases the price rises. If productivity increases the price falls. If wage rate and productivity vary in step the price stays put. All this can be directly read off from the four-quadrant graphic (which is composed of four positive Cartesian quadrants).

In any case, labor gets the whole output, and profit for the business sector as a whole is zero. All changes in the system are – due to perfect flexibility – directly reflected by the market clearing price. This price is, in the familiar animistic economic jargon, ‘governed by the forces of supply and demand’ except for the fact that such ‘forces’ do not exist. From the formal framework no Invisible Hand explanation follows. Most, or even all, ‘force’ explanations are an illegitimate add-on that brings every theoretical approach down to the level of storytelling.

The price is determined by the axioms and conditions. Conditional price flexibility makes it possible that the consumption economy is reproducible at any level of employment/unemployment and at any level of productivity. Conditional price flexibility does not imply the notion of equilibrium. In a sense, the elementary consumption economy with conditional price flexibility implies Say’s Law without the untenable claim that full employment is established ‘in the long run’ by ‘market forces.’ Conditional price flexibility is an algebraic concept. Clearly, the conditions can be lifted at any time.

The pure consumption economy with market clearing, budget balancing and conditional price flexibility can go anywhere, it may grow or shrink in subsequent periods. However, at the moment we have working hours L as the sole input to production. This implies that, for a start, raw material and energy is freely available and is taken directly into production. And, since the pure consumption economy is a monetary

economy, it is implied that money as transaction medium is made available by some institution at no costs. All these material and monetary ingredients, and some more to be sure, have to be added successively at the next analytical stages. Clearly, restrictions from the material or monetary side may limit the hitherto unlimited moving space of the consumption economy. At the moment only available labor and productivity determine the upper limit of output.

Period t and the next period $t + 1$, and thus Figures 3 and 2, are formally connected by the 4th axiom. All changes are supposed to happen at the beginning of the respective period of given length which in turn has to be fixated at the beginning of the analysis.

2.3 Definitions

Income categories

Definitions are supplemented by connecting variables on the right-hand side of the identity sign that have already been introduced by the axioms. With (5) wage income Y_W and distributed profit Y_D is defined:

$$Y_W \equiv WL \quad Y_D \equiv DN. \quad (5)$$

Definitions add no new content to the set of axioms but determine the logical context of concepts. New variables are introduced with new axioms.

Given the paths of the elementary variables, the development of the composed and defined variables is also determined.

Key ratios

We define the sales ratio as:

$$\rho_X \equiv \frac{X}{O}. \quad (6)$$

A sales ratio $\rho_X = 1$ indicates that the quantity bought/sold X and the quantity produced O are equal or, in other words, that the product market is cleared.

We define the expenditure ratio as:

$$\rho_E \equiv \frac{C}{Y}. \quad (7)$$

An expenditure ratio $\rho_E = 1$ indicates that consumption expenditures C are equal to total income Y , in other words, that the household sector's budget is balanced.

We define the factor cost ratio as:

$$\rho_F \equiv \frac{W}{PR}. \quad (8)$$

A factor cost ratio $\rho_F = 1$ indicates that the nominal value of one hour's labor input W is equal to the value of output PR which implies that profit per hour, respectively per unit of output, is zero.

We define the distributed profit ratio as:

$$\rho_D \equiv \frac{DN}{WL}. \quad (9)$$

The distributed profit ratio may, for instance, assume a value between zero and 10 percent.

2.4 Assumptions

Assumptions are a necessary ingredient of every theory. Their justification or, as the case may be, their futility materializes in the course of the analysis.

For a start it is now assumed that the elementary axiomatic variables vary at random. This produces an evolving economy. The respective probability distributions of the change rates are given in general form by:

$$\begin{array}{ll} Pr(l_W \leq \ddot{W} \leq u_W) & Pr(l_R \leq \ddot{R} \leq u_R) \\ Pr(l_L \leq \ddot{L} \leq u_L) & Pr(l_P \leq \ddot{P} \leq u_P) \\ Pr(l_D \leq \ddot{D} \leq u_D) & Pr(l_X \leq \ddot{X} \leq u_X) \\ Pr(l_N \leq \ddot{N} \leq u_N) & \end{array} \quad (10)$$

The four axioms, including (10), constitute a stochastic simulation.

It is, of course, also possible to switch to a completely deterministic rate of change for any variable and any period. The structural formalism does not require a preliminary decision between determinism and indeterminism.

Before the formalism can be applied concrete assumptions about the initial conditions and the upper (u) and lower (l) bounds of the probability distributions have to be made. This is the point where input from experience is needed. We know from observation for instance that productivity changes lie normally between, say, 5 percent and 0 percent per period. But it may happen that the rate of change is -100 percent in case a plant burns down or is cut off from the power supply or is paralyzed by a software bug or something else of this sort. In order to bring the simulation as close as possible to reality, we take the probability distribution from experience, and in order to make it simple, we first exclude all kinds of accidents.

We know that probability distributions may change over time and that accidents do happen. What we do not know is the exact date and extent of a possible accident in the future. For a start these features of reality are excluded from the analysis. They may be taken in as soon as the elementary relationships have been clarified.

A simulation yields a scenario and not a prediction. Each scenario is fully determined, explicit, and traceable in every detail. A simulation as defined by the four structural axioms and the probability distributions is a well-defined mathematical object just like a system of equations. While they are formally on the same footing, both mathematical objects yield different kinds of outputs: the system of equations yields a solution vector, a simulation yields a bundle of paths. This bundle has a counterpart in reality.

The upper (u) and lower (l) bounds of the respective probability distributions are, for a start, taken to be symmetrical around zero. This produces the drifting or stationary economy as shown in Figure 2. There is no need at this early stage to discuss the merits and demerits of different probability distributions. Eq. (10) represents the general stochastic case which in the limit $u - l \rightarrow 0$ shades into determinism. The evolving consumption economy is a well-defined mathematical object that contains *no* subjective elements.

3 Defect #1 The price mechanism

We must look at the price system as such a mechanism for communicating information if we want to understand its real function – a function which, of course, it fulfills less perfectly as prices grow more rigid. (Hayek, 1945, p. 526)

3.1 Conditional price flexibility

From (3) and the other axioms and the definitions follows the price as dependent variable:

$$P = \frac{\rho_E}{\rho_X} \frac{W}{R} \left(1 + \frac{DN}{WL} \right). \quad (11)$$

This is the general structural axiomatic Law of Supply and Demand for the pure consumption economy with one firm (for the generalization see 2014a). The price equation states that the price is equal to the product of the expenditure ratio ρ_E , the inverse of the sales ratio ρ_X , unit wage costs $\frac{W}{R}$, and the distributional factor $1 + \rho_D$. The structural axiomatic price formula is testable in principle and fully replaces supply-function–demand-function–equilibrium. In eq. (11) the woolly terms supply and demand are represented by measurable variables and not by fictional functions.

Under the condition of market clearing one gets:

$$P = \rho_E \frac{W}{R} (1 + \rho_D) \quad (12)$$

if $\rho_X = 1$.

The price reflects all changes on the right hand side. Conditional price flexibility is, clearly, an algebraic concept. There is no vacuous speculation about the behavior of households and firms. We have axioms and conditions and that is all. Behavioral assumptions would only over-determine the formal system.

Under the additional conditions of budget balancing and zero distributed profit follows:

$$P = \frac{W}{R} \quad (13)$$

if $\rho_X = 1, \rho_E = 1, \rho_D = 0$.

This is the most elementary version of the Law of Supply and Demand for the pure consumption economy with one firm. Eq. (13) summarizes Figure 3. The price equation states that the market clearing price is always equal to unit wage costs $\frac{W}{R}$, that is, the market price is determined directly by the wage rate and inversely by the productivity. Employment is not a determinant of the price, neither is the quantity of money.

From (13) follows immediately

$$\frac{W}{P} = R \quad (14)$$

that is, the real wage is equal to the productivity.

The crucial point is that the real wage is *not* determined by supply-demand-equilibrium in the labor market. If anything, only the *nominal* wage rate is. The wage rate W may go up or down by an arbitrary percentage rate, this has, due to conditional price flexibility, no effect whatever on the real wage.

The crucial *systemic fact* is: when the product price is determined in the elementary economy by ‘supply and demand’ in the product market then the real wage cannot be determined by ‘supply and demand’ in the labor market. Because of this, the general assertion that all markets are cleared by the price mechanism is false. Eqs. (13) and (14) in combination amount to a straightforward refutation of commonplace price theory. Perfect price flexibility in the product market renders the supposed real-wage–employment mechanism in the labor market ineffective.

Because the real wage is determined by the structural properties of the elementary consumption economy and cannot be altered by changes of the wage rate there is no way to effect an employment expansion by lowering the wage rate. Hayek's signaling has no real effect.

From this follows that stickiness, more precisely wage stickiness, is not an explanation of the non-clearing of the labor market in a regime of conditional price flexibility. The wage rate has, according to (13) not the function of a signal but of the numéraire. If you think, there is a real balance effect that could do what signaling cannot do, think twice or better forget it.

Note well, that the refutation of Hayek's flexibility story does not consist in the lame Post Keynesian argument that it is not feasible in practice because of menu costs, frictions, and so on. This is not a question of practicability but of principle. The argument is instead: granted the full flexibility of wage rate and price the market system does not approach – neither in the short nor the long run – a state that has been defined in a broadly acceptable way as full employment.

Post Keynesians have to be criticized for habitually taking refuge to the silly man-of-the-street argument: this may be true in theory but not in practice. To add frictions to the underlying general equilibrium theory in order to make it more "realistic" is no real progress, only the replacement of the underlying false theory is. Put otherwise: rigidities exist and can always be reduced but this does not, even in the ideal case, lead to overall market clearing.

In sum: From the fact that conditional price flexibility clears the product market does not follow that wage rate flexibility clears the labor market. The deeper reason is due to the structural property that the product and the labor market are not, so to speak, on the same plane but orthogonal. Walrasian theory missed this crucial point. Hayek's signaling is futile and his – and the representative economist's – understanding of the real function of the price system as information processor has no sound theoretical foundation.

3.2 Methodological consequences

One methodological point is of primary importance in this context. The issue of friction vs. perfect motion played a famous role in physics and this has some significance for economics. Aristotle argued that all moving bodies seek their natural places of rest. Thus he implanted some intentionality into the moving bodies which always appeals to animistic thinking. The almost insurmountable problem on the way to the true theory was that the Aristotelians had as much empirical support as they ever wanted. Imagine a rolling ball, we all agree that it will come to rest after some time no matter how hard it has been pushed. So we have a plausible law of motion and undeniable empirical proof. Against all evidence Galileo argued: imagine we polish the ground perfectly, then the ball will never come to rest no

matter how hard it had been pushed. Thereby, he established the Law of Inertia which later reappeared as axiom in Newton's theory.

The point is that Aristotelian commonsensers, empiricists and inductivists never arrived at any law that is worth mentioning. From this fact J. S. Mill derived the fundamental methodological rule for economics.

Since, therefore, it is vain to hope that truth can be arrived at, either in Political Economy or in any other department of the social science, while we look at the facts in the concrete, clothed in all the complexity with which nature has surrounded them, and endeavour to elicit a general law by a process of induction from a comparison of details; there remains no other method than the *à priori* one, or that of "abstract speculation." (Mill, 1874, V.55)

This abstract speculation, though, has to be based on the correct set of premises. To point out against general equilibrium theory that there are rigidities and frictions does not count as a real refutation albeit it is obviously true. What can be observed every day is that most economic discussions still take place within the Aristotelian framework. The price rigidity argument is a case in point. Let us put it thus: price rigidity is an empirical fact that explains nothing, least of all the built-in defects of the market system.

The Aristotelian framework is so deeply ingrained that most people are not aware of it.

Aristotle builded upon a few deliberately chosen concepts – such as matter and form, act and power – very broad, and in their outlines vague and rough, but solid, unshakable, and not easily undermined; and thence it has come to pass that Aristotelianism is babbled in every nursery, that "English Common Sense," for example, is thoroughly peripatetic, and that ordinary men live so completely within the house of the Stagyrte that whatever they see out of the windows appears to them incomprehensible and metaphysical. (Peirce, 1931, 1.1)

In economics, the Aristotelian framework is still in use in the Cambridge School of Loose Verbal Reasoning with Keynes as one of its better known proponents. The Austrian School with Hayek as one of its better known proponents is even worse in methodological respects.

From the methodological standpoint Walrasianism, Keynesianism, and Austrianism is unacceptable, albeit for different reasons. What unites them is that neither approach can explain how the market system works.

4 Defect #2 The profit mechanism

Total profit consists of monetary and nonmonetary profit. Here we are at first concerned with monetary profit.

The business sector's monetary profit/loss in period t is defined with (15) as the difference between the sales revenues – for the economy as a whole identical with consumption expenditure C – and costs – here identical with wage income Y_W :

$$Q_m \equiv C - Y_W. \quad (15)$$

Because of (3) and (5) this is identical with:

$$Q_m \equiv PX - WL. \quad (16)$$

This form is well-known from the theory of the firm.

From (15) and (1) follows:

$$Q_m \equiv C - Y + Y_D. \quad (17)$$

or, using the definitions (7) and (9),

$$Q_m \equiv \left(\rho_E - \frac{1}{1 + \rho_D} \right) Y. \quad (18)$$

The four equations (15) to (18) are formally equivalent and show profit under different perspectives. The Profit Law (18) tells us that total monetary profit is zero if $\rho_E = 1$ and $\rho_D = 0$. Profit or loss for the business sector as a whole depends on the expenditure and distributed profit ratio (for details see 2013). Total income Y is the scale factor.

The Profit Law implies in detail:

- The business sector's revenues can only be greater than costs if, in the simplest of all possible cases, i.e. $\rho_D = 0$, consumption expenditures are greater than wage income.
- Overall profit does neither depend upon the agents' personal qualities, motives, their ideas about what profit is, nor on profit maximizing behavior.
- In order that profit comes into existence for the first time in the pure consumption economy the household sector must run a deficit at least in one period. This presupposes the existence of a credit creating entity.

- Profit is, in the simplest case, determined by the increase and decrease of household sector's debt.
- Wage income is the factor remuneration of labor input L . Profit is not a factor income. Since capital is nonexistent in the pure consumption economy profit is not functionally attributable to capital.
- There is no relation at all between profit, capital, marginal or average productivity.
- Profit has no real counterpart in the form of a piece of the output cake. Profit has a monetary counterpart. In a 'real' economy profit does not exist. In other words: the 'real' economy is not the real economy, the monetary economy is the real economy.
- The existence and magnitude of overall profit does not depend on the ownership of the firms that comprise the business sector.
- The value of output is, in the general case, different from the sum of factor incomes. This is the defining property of the monetary economy.
- Profit is a factor-independent residual and qualitatively different from wage income. Therefore it is an elementary mistake to maintain that total income is the sum of wages and profits.
- There is a close relation between profit/loss and the expansion/contraction of credit for the economy as a whole.
- There is no antagonism between total wages and total profits and the distribution of consumption good output has nothing at all to do with profit.
- Innovation and efficiency are irrelevant for the profit of the business sector as a whole. It is a fallacy of composition to trivially generalize what can be observed in an individual firm.

The crucial point is that profit for the economy as a whole cannot be derived from the behavior of the individual firm. That is, the standard microeconomic approach cannot, as a matter of principle, deliver the correct profit theory. The familiar stories about the working of the profit mechanism are false since Adam Smith.

The amount of overall profit depends first of all on the growth of debt of the household sector (or government sector, or the rest of the world in case of a nation state). Hence overall profit cannot be interpreted as a reward or an indicator of superior economic performance. Nor can overall loss be interpreted as an indicator of inferior performance. In the absence of profit distribution, i.e. $\rho_D = 0$, overall profit can only be interpreted as an indicator of debt growth. When we compare two countries that are equal in real terms the more profitable country is not the country

that is more productive but that expands debt faster. If profit is taken as an indicator that directs the flow of financial capital between countries then the capital is *not* directed to the most productive use. The general claim that the profit mechanism helps to allocate resources optimally has no sound theoretical foundation. As a specific claim it holds on the microeconomic level between two firms with different productivities. The generalization of what is true on the microeconomic level, though, is a fallacy of composition.

5 Defect #3 Endogenous structural stress

When two (or more) non-identical firms operate in one market, which is assumed at the moment, total profit must be greater than zero or the number of firms eventually shrinks to one. This is obvious, since with zero total profit the profit of one firm is necessarily outweighed by a loss of the same total amount in the other firms. Because of the irreducible heterogeneity of firms at any point in time it is therefore necessary that overall profit as given with (18) is always greater than zero.

In the limiting case of zero overall profit the profit in each individual firm must also be exactly zero. It is pretty obvious that this precision is unattainable. However, if we start with a full employment situation, then, from the simple fact that not all firms can realize zero profit simultaneously, follows that some firms make a loss and after some time drop out of the market. When we presuppose that productivity variations occur at random and the rates of change are symmetrically around zero in each firm then the initial full employment economy moves spontaneously toward unemployment if there is an upper limit for cumulated losses because some random walks go over the cliff according to statistical laws. To counteract this spontaneous tendency overall profit must be greater than zero. This keeps the marginal firm, which can be any firm if productivity variations occur at random, in period t in the market and this is the precondition for the continuance of the initial full employment situation.

What is needed is a certain minimum profit in period t that depends on the degree of structural inhomogeneity. Each single firm contributes to inhomogeneity but no firm can determine it single-handedly. In very general terms, structural stress is a function of the profit for the business sector as a whole and the degree of heterogeneity within the business sector. When profit for the business sector is greater than the structural minimum profit all firms are making profits. A straightforward gauge of structural stress for a consumption economy with two firms is given by (for details see 2011c, Sec. 8):

$$\zeta \equiv \frac{Q_m^{\min}}{Q_m}. \quad (19)$$

If $\zeta = 0$ and $Q_m > 0$ all firms make a profit relative to their size. If $\zeta = 1$ the profit of the marginal firm is exactly zero, the whole profit accrues to the intramarginal firm, and with $\zeta > 1$ structural change sets in. When the structural minimum profit is given, then structural stress varies inversely with the development of profit for the business sector as a whole. Vice versa, with any given total profit the stability of the economy increases with the degree of homogeneity. Structural stress is a random variable that in turn depends on two random variables which may cancel out or not. This means that structural stress varies erratically.

Since varying productivity differentials are a normal and enduring feature of the economy, profit must be greater than zero in the pure consumption economy and this means $\rho_E > 1$ and/or $\rho_D > 0$ in eq. (18). When we start with full employment then it is necessary that the profit of the marginal firm is kept at or above zero.

Under the condition that productivity varies at random and total profit varies at random follows that firms are kicked out of the market with a certain probability. These random failures do not increase the efficiency of the economy as a whole but only unemployment. The drop of overall profit to zero can happen at any time but does not indicate that the economy is inefficient or that the marginal firm is not needed under the long term perspective. This kind of random destruction cannot be relabeled as creative destruction.

There is no spontaneous mechanism in the market system which ensures that total profit is always at least equal to the structural minimum profit. From the top-level perspective the market system is not self-regulating.

6 Defect #4 The inefficiency mechanism

In Figure 3 all labor input has been devoted to direct production. This is the simplest structure. Reality is a bit more complex and the organization of a typical firm consists of direct and indirect production. Indirect labor input contributes in most cases to the production of final output but this relationship is rather loose and opaque. In Figure 4 total labor input L is now allocated between direct and indirect production.

Let us take accounting and general administration as an example for indirect production. On the downward pointing L -axis first indirect labor input is plotted then direct input. This shifts the straight line that represents the 2nd axiom southward. Total employment remains constant and is only reallocated, i.e. $L_0 = L_i + L_d$. This pure reallocation is different from adding indirect input L_i to unchanged direct input $L_d = L_0$. The analytical merit of pure reallocation consists in leaving total income and expenditures unaltered.

The broken line in the southeastern quadrant represents the initial situation. The introduction of indirect input involves four logical possibilities for the relationship between productivity and output.

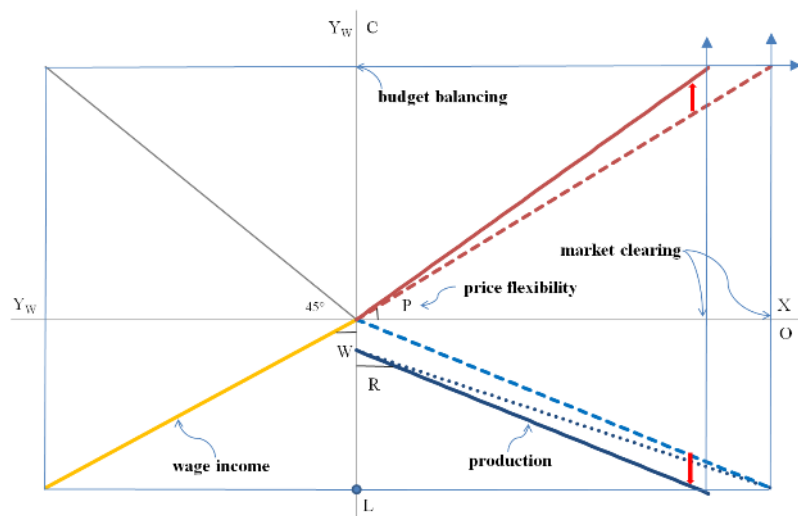


Figure 4: Direct and indirect production (compares to Figure 3)

- (i) The reallocation is output-neutral, which means that indirect input increases the productivity of direct production. The dotted line shows the output-neutral productivity increase. Since output remains unchanged the market clearing price, too, remains unchanged.
- (ii) The reallocation is productivity-neutral with regard to direct productivity R , which means that output and *average* productivity falls. The initial broken line is shifted downward to the position of the unbroken line. Since output O falls the market clearing price P rises.
- (iii) The reallocation is productivity-increasing, which means that output and average productivity rise. This effects a fall of the market clearing price.
- (iv) The reallocation is productivity-decreasing, which means that output and average productivity fall. This effects an increase of the market clearing price that is larger than in case (ii).

So first of all it is important to see that direct and indirect labor input is not necessarily the same as productive and unproductive labor input. In case (ii) and (iv) both concepts overlap. The latter case is what people have in mind when they complain about bureaucracy

Indirect labor input is a mixed bag. It can be externally imposed like government statistics/reports or higher standards of hygiene/environmental protection. It can be caused by psychological/sociological factors like real or imagined need for security, prestige, or wellness. It can be caused by competition and lead to increased sales efforts in the form of promotion, marketing, or public relations. This indirect labor input produces output that is different from the firm's final output and is not sold to

the household sector. All indirect costs have to be recouped via the product price. This, and not Hayekian signaling, is the primary function of the price.

The common denominator of all forms of indirect labor input is that it does not affect the business sector's overall profit which is zero in Figures 3 and 4. Hence, from the business sector's perspective it does not matter whether indirect labor input is productive or not. For the individual firm, too, it does not matter provided all firms move in step.

Thus, we can have the following scenario. Total labor input grows, but in the process the composition changes from direct to indirect labor input. The productivity of direct input R increases steadily but indirect input is assumed to be productivity-neutral such that the combined effect is a decline of *average* productivity. In this case there is a continuous increase of the market clearing price according to (13). This inflationary drift is not due to a rising quantity of money or to rising wage rates but only to the composition of direct and indirect labor input and the indirect productivity effect. The whole process is neutral with regard to overall profit. Therefore, the process is reproducible for an indefinite time span even if, from the standpoint of an outside observer, indirect input is in fact unproductive or even wasteful. Whatever the effect, it is ultimately the household sector which is affected via a higher or lower price. The business sector as a whole functions as neutral intermediary.

The individual firm, however, is not a neutral intermediary because it can alter its relative position vis-à-vis the rest of the business sector. This can produce false incentives. While it is, for example, immaterial for the business sector as a whole whether hygiene or security standards are high or low, a single firm can increase its own profit by lowering the standards, that is, by reducing the indirect labor input that is devoted to these specific tasks. This lowers the profits in the rest of the business sector while overall profit is unaltered because it is determined by the expenditure and the distributed profit ratio according to (18) and is here set to zero.

The zero sum redistribution of profit within the business sector affects the other firms with only a negligible absolute amount depending on the relative size of the single firm. This minuscule profit reduction is normally not distinguishable from ongoing random changes. So, the noticeable profit increase in one firm has apparently no negative effect for other businesses; in fact, the complementary reduction simply vanishes from sight. In contradistinction, the effect on the household sector makes itself felt as a rise in unemployment. Whether this effect is temporary or lasting can be left open here.

The opposite case is that all firms increase in step indirect labor input in all forms of sales promotion. This is neutral for the business sector as long as the overall expenditure ratio stays at unity but it affects the household sector in the form of a higher product price. As a matter of principle, there is no economic limit for the reduction of direct labor and the complementary expansion of indirect labor no

matter whether this reallocation is productive or wasteful as long as the firms move – voluntarily or involuntarily does not matter – in step.

In sum: because all combinations of direct and indirect labor input in the elementary consumption economy are profit neutral for the business sector as a whole there is no optimal point to choose and no built-in mechanism that establishes overall allocative efficiency. The elementary consumption economy is reproducible at any level of inefficiency because overall profit does not depend on productivity or efficiency.

7 Defect #5 The mixed monetary order

In order to reduce the monetary phenomena to the essentials it is supposed at first that all financial transactions are carried out without costs by the central bank. The stock of money then takes the form of current deposits or current overdrafts. Initial endowments can be set to zero. Then, if the household sector owns current deposits the current overdrafts of the business sector are of equal amount and vice versa if the business sector owns current deposits. Money and credit are perfectly symmetrical. The current assets and liabilities of the central bank are equal by construction.

7.1 Stocks and quantity of money

If income is higher than consumption expenditures the household sector's stock of money increases. The change in period t is defined as:

$$\Delta \bar{M}_{\mathbf{H}} := Y - C := Y(1 - \rho_E). \quad (20)$$

The alternative identity sign $:=$ indicates that the definition refers to the monetary sphere. There is no change of stock if the expenditure ratio is unity.

The stock of money $\bar{M}_{\mathbf{H}}$ at the end of an arbitrary number of periods \bar{t} is defined as the numerical integral of the previous changes of the stock plus the initial endowment:

$$\bar{M}_{\mathbf{H}t} \equiv \sum_{t=1}^{\bar{t}} \Delta \bar{M}_{\mathbf{H}t} + \bar{M}_{\mathbf{H}0}. \quad (21)$$

The interrelation between the expenditure ratio and the households sector's stock of money, is then given by:

$$\bar{M}_{\mathbf{H}t} \equiv \sum_{t=1}^{\bar{t}} Y_t(1 - \rho_{Et}) \quad \text{if} \quad \bar{M}_{\mathbf{H}0} = 0. \quad (22)$$

The household sector's actual stock of money ultimately depends on the preceding sequence of expenditure ratios.

The changes in the stock of money as seen from the business sector are symmetrical to those of the household sector:

$$\Delta \bar{M}_B := C - Y := Y(\rho_E - 1). \quad (23)$$

The business sector's stock of money at the end of an arbitrary number of periods is accordingly given by:

$$\bar{M}_{Bt} \equiv \sum_{t=1}^t \Delta \bar{M}_{Bt} + \bar{M}_{B0}. \quad (24)$$

From the central bank's perspective the quantity of money at the end of an arbitrary number of periods is given by the absolute value either from (22) or (24):

$$\bar{M}_t \equiv \left| \sum_{t=1}^t \Delta \bar{M}_t \right| \quad \text{if} \quad \bar{M}_0 = 0. \quad (25)$$

The central bank is at first supposed to be entirely passive and to simply execute the autonomous transactions between household and business sector. Note that the market clearing price is determined by (11) and not by the quantity of money (25), which is a dependent variable. The common element between price and quantity of money is given by the expenditure ratio ρ_E .

7.2 Transaction money out of nothing

We take the elementary consumption economy as shown in Figure 3 as point of departure. This means, the 1st axiom simplifies because of $DN = 0$ and the expenditure ratio now relates to wage income only, i.e. $\rho_E \rightarrow \rho_{EW}$.

In the initial period the conditions of market clearing and budget balancing hold, i.e. $\rho_X = 1$, $\rho_{EW} = 1$. The central bank provides the transaction medium and creates money out of nothing. Loosely speaking, it finances the business sector's payroll, whatever it is.

By sequencing the initially given period length of one year into months the *idealized* transaction pattern that is displayed in Figure 5a results. It is assumed that the monthly income $Y_w/12$ is paid out at mid-month. In the first half of the month the daily spending of $Y_w/360$ increases the current overdrafts of the households. At mid-month the households change to the positive side and have current deposits of $Y_w/24$ at their disposal. This amount reduces continuously towards the end of the month. This pattern is exactly repeated over the rest of the year. At the end of each subperiod, and therefore also at the end of the year, both the stock of money and the *quantity of money is zero*. Money is present and absent depending on the time frame of observation.

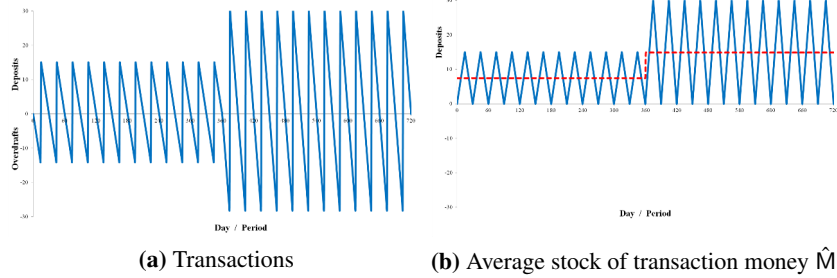


Figure 5: Household sector's transaction pattern for different nominal incomes in two periods

In period 2 the wage rate and the price is doubled. Since no cash balances are carried forward from one period to the next, there results *no* real balance effect provided the doubling takes place exactly at the beginning of period 2.

From the perspective of the central bank it is a matter of indifference whether the household or the business sector owns current deposits. The pattern of Figure 5a translates into the average amount of current deposits in Figure 5b. This average stock of transaction money depends on income according to the general transaction equation

$$\hat{M}_T \equiv \kappa Y. \quad (26)$$

The variable \hat{M}_T is not to be taken as the demand for transaction balances; it is a straightforward period average which results from the autonomous transactions between the business and the household sector.

For the transaction pattern that is here assumed as an idealization the index is $1/48$. Different transaction patterns are characterized by different numerical values of the transaction pattern index.

Taking (26), (6) and (7) together one gets the explicit transaction equation for the limiting case of market clearing and budget balancing:

$$(i) \hat{M}_T \equiv \kappa RLP \quad (ii) \frac{\hat{M}_T}{P} \equiv \kappa O \quad (27)$$

if $\rho_X = 1, \rho_E = 1$.

We are now in the position to substantiate the notion of accommodation as a money-growth formula. According to (i) the central bank enables the average stock of transaction money to expand or contract with the development of productivity, employment, and price. In other words, the real average stock of transaction money, which is a statistical artifact and no physical stock, is proportional to output (ii) if the transaction index is given and if the ratios ρ_E and ρ_X are unity. Under these *initial* conditions money is endogenous and neutral in the structural axiomatic context.

Money emerges from *autonomous* market transactions and has *three* aspects: stocks of money (\bar{M}_H, \bar{M}_B), quantity of money (here $\bar{M} = 0$ at period beginning and end because of $\rho_E = 1$) and average stock of transaction money ($\hat{M}_T > 0$).

Eq. 13 says that the market clearing price doubles if the wage rate doubles under the condition of budget balancing, here $\rho_{EW} = 1$. Eq. (27) says that in this case the average stock of transaction money (i) doubles, while the real stock (ii) remains unchanged. If, on the other hand, employment L in (27) doubles, then the average stock of transaction money (i) doubles *and* the real stock (ii) doubles, too. In the first case we find a correlation between the average stock of transaction money and the market clearing price, i.e. the commonplace Quantity Theory is confirmed, in the second case not. Note that the quantity of money according to (25) is zero at period start and end.

7.3 The transaction unit

Hitherto it has been assumed that the central bank works costless. This assumption is now dropped.

The business sector consists now of a consumption good producing firm 1 and the central bank as the second firm 2. To begin with, the central bank handles only the money transactions. Total employment is given by:

$$L \equiv L_1 + L_2. \quad (28)$$

To focus exclusively on the monetary phenomena variations of total employment are excluded.

Total wage income consists according to (1) now of the wage incomes of both firms. To streamline the analysis the wage rates for all firms are set equal.

$$Y_W = \underbrace{W_1}_W L_1 + \underbrace{W_2}_W L_2. \quad (29)$$

The household sector apportions its consumption expenditures between the purchase of the consumption good and the purchase of transaction services. With X_2 the number of transactions per period that are carried out by the central bank on behalf of the households is denoted:

$$C = P_1 X_1 + P_2 X_2. \quad (30)$$

Consumption expenditures are equal to income over all periods, i.e. $\rho_{EW} = 1$. The household sector as a whole neither saves nor dissaves.

Overall monetary profit is differentiated for the two firms:

$$\begin{aligned}
Q_{m1} &\equiv P_1 X_1 - W L_1 \\
Q_{m2} &\equiv P_2 X_2 - W L_2.
\end{aligned} \tag{31}$$

Under the condition that both markets are cleared, i.e. $\rho_X = 1$, this can be rewritten as:

$$\begin{aligned}
Q_{m1} &\equiv P_1 R_1 L_1 \left(1 - \frac{W}{P_1 R_1} \right) \quad \rho_{X1} = 1 \\
Q_{m2} &\equiv P_2 R_2 L_2 \left(1 - \frac{W}{P_2 R_2} \right) \quad \rho_{X2} = 1.
\end{aligned} \tag{32}$$

Overall profit is zero because of $C = Y_W$ according to (15). The zero profit condition for a single firm reads $\frac{W}{PR} = 1$. Under this conditions follows from (32) that absolute prices are equal to unit wage costs, i.e. $P_1 = \frac{W}{R_1}$ respectively $P_2 = \frac{W}{R_2}$, and that relative prices $\frac{P_1}{P_2}$ are equal to the inverse productivity ratio $\frac{R_2}{R_1}$. In sum: both markets are cleared, the household sector's budget is balanced and profits are zero for both the consumption good producing firm and the transaction unit of the central bank. Money transactions consume resources, the less so, the higher the productivity of the transaction unit is. The price the households pay for each transaction P_2 follows from (32) and the zero profit condition.

The elementary zero profit consumption economy with a transaction services producing central bank is reproducible for an indefinite time. If the wage rate doubles, both the product price and the service price double, but the real variables employment, productivity, and output remain unchanged.

7.4 The banking unit

The transaction unit handles the day to day transactions between the household and the business sector which consist at first only of wage payments and consumption expenditures. The market clearing price of the transaction services covers exactly the unit wage costs. Up to this point only interest-free overdrafts but no loans have been provided.

It is now assumed that the household sector dissaves in period 1, i.e. $\rho_{EW} > 1$. This makes that the overdrafts increase in period 1. As a mirror image the business sector's deposits increase. According to (25) the quantity of money at the end of period 1 is $\bar{M} > 0$ as can be seen in Figure 6.

So far, only the transaction unit was involved. In period 2 the household sector takes up a one-period loan at the banking unit. This reduces the household sector's overdrafts which are payable on demand and consolidates the total debt in part.

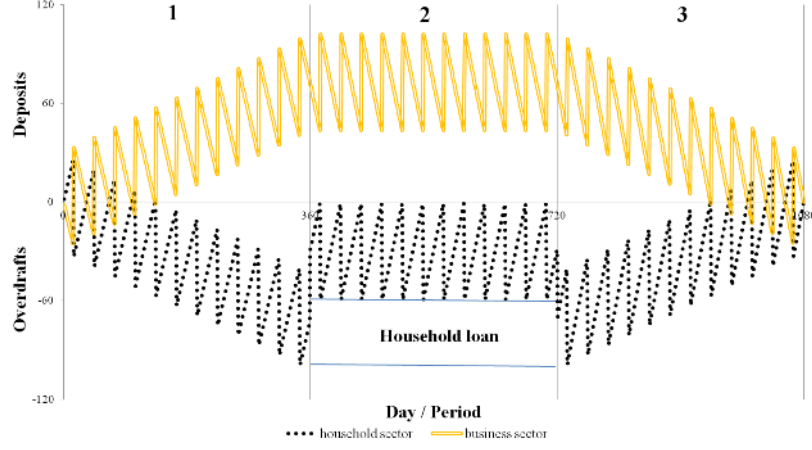


Figure 6: Household sector's overdrafts and business sector's deposits at the central bank due to an expenditure ratio >1 in period 1 and <1 in period 3 with the household sector taking up a loan in period 2

The one-period loan reduces the household sector's risk of illiquidity in period 2. Dissaving takes place in period 1, saving follows in period 3. The inverse sequence would give rise to a loan demand of the business sector.

The respective owners of current deposits could, for example, switch to interest bearing longer term savings accounts at the central bank. This option is left out of the picture here.

The inclusion of the banking unit entails that the given resources of the business sector L have first to be reallocated:

$$L \equiv L_1 + L_2 + L_3. \quad (33)$$

As a consequence total wage income is then given by:

$$Y_W = \underbrace{W_1}_{\bar{W}} L_1 + \underbrace{W_2}_{\bar{W}} L_2 + \underbrace{W_3}_{\bar{W}} L_3. \quad (34)$$

The interest payments to the banking unit have to be subsumed under consumption expenditures:

$$C = P_1 X_1 + P_2 X_2 + J_3 \bar{A}_3. \quad (35)$$

The price is replaced by the interest rate J_3 and the quantity bought from the banking unit X_3 is replaced by the amount of the loan \bar{A}_3 which is an asset from the viewpoint of the central bank.

The reallocation of labor input is neutral with regard to the price of the consumption good. When labor input L_3 is taken away from firm 1 output falls. At the same time consumption expenditures are redirected away from purchases of consumption good to purchases of the loan services of the banking unit, i.e. C_1 goes down and C_3 goes up. This leaves the price of the consumption good unaffected under the given conditions. The household sector buys less of the consumption good and more services from the central bank and according to this demand shift the unaltered total labor input is reallocated.

Profit for each firm is zero, i.e. $\frac{W}{PR} = 1$:

$$\begin{aligned} Q_{m1} &\equiv P_1 R_1 L_1 \left(1 - \frac{W}{P_1 R_1} \right) & \rho_{X1} &= 1 \\ Q_{m2} &\equiv P_2 R_2 L_2 \left(1 - \frac{W}{P_2 R_2} \right) & \rho_{X2} &= 1 \\ Q_{m3} &\equiv J_3 \bar{A}_3 \left(1 - \frac{W}{J_3 \frac{\bar{A}_3}{L_3}} \right) & \rho_{X3} &= 1. \end{aligned} \tag{36}$$

The zero profit conditions define the relations of product price, transaction price and rate of interest. The relationships P_1, P_2, J_3 are inverse to the objectively given productivities in the respective firms R_1, R_2, R_3^* . The inclusion of the banking unit and the appearance of a rate of interest on loans results in a reallocation of demand and resources. The loan interest rate is, at first, alone determined by the production conditions of the banking unit. The banking unit's interest earnings are equal to its wage costs and profit is zero just like in the other firms.

7.5 The interest rate as real constant

From the banking unit's profit definition

$$Q_{m3} \equiv J_3 \bar{A}_3 - W L_3 \tag{37}$$

follows as a corollary under the zero profit condition in period 2:

$$\begin{aligned} J_{32} \bar{A}_{32} &\doteq W_{.2} L_{32} \\ \text{if } Q_{m32} &= 0. \end{aligned} \tag{38}$$

Let us assume that the loan is revolved in period 3 and that the wage rate increases:

$$J_{32} \bar{A}_{32} (1 + \ddot{W}_{.3}) \doteq W_{.2} (1 + \ddot{W}_{.3}) L_{32}. \quad (39)$$

From (36) follows that the product price of firm 1 and the service price of the transaction unit increase with the same rate. Therefore, the relation of both prices remains unchanged.

The banking unit could satisfy the zero profit condition by increasing the interest rate $J_{33} = J_{32} (1 + \ddot{W}_{.3})$. However, eq. (39) can obviously also be satisfied by increasing the nominal amount of the household sector's loan. And this is actually the correct way.

Let us first define the real amount of the loan in period 2 as quotient of the nominal amount and the wage rate:

$$\bar{A}_{32}^{real} \equiv \frac{\bar{A}_{32}}{W_{.2}}. \quad (40)$$

With this, (39) reduces to:

$$J_{32} \bar{A}_{32}^{real} \doteq L_{32}. \quad (41)$$

And for the rate of interest follows finally:

$$J_{32} \doteq \frac{1}{R_{32}} \quad (42)$$

with $R_{32} \equiv \frac{\bar{A}_{32}^{real}}{L_{32}}.$

The rate of loan interest only depends on the loan processing productivity R_{32} in the banking unit. Loans are produced like any other good. As long as the productivity remains constant the rate of interest remains constant, no matter how the wage rate, and the market clearing price with it, develops. What is required is that the nominal loan is indexed with the wage rate. As long as the nominal amount of the loan increases or decreases with the wage rate the real amount of the loan remains constant, that is:

$$\bar{A}_{3t}^{real} \equiv \frac{\bar{A}_{3t-1} (1 + \ddot{W}_t)}{W_{t-1} (1 + \ddot{W}_t)}. \quad (43)$$

With given employment, the productivity in the banking unit (42) remains constant and therefore the rate of interest is unaffected by wage rate and price changes. The Fisherian distinction between real and nominal interest rate falls flat. It is impossible that the structural interest rate turns negative. The indexing of overdrafts and loans

in turn implies that the stock of deposits must also be indexed. This keeps the purchasing power of the stock of deposits constant. As a result, both sides of the central bank's balance sheet vary in step. Thus, the changes of wage rate and market clearing price, which are coupled for the pure consumption economy as a whole by:

$$P = \frac{W}{R} \quad (44)$$

$$\text{if } \rho_X = 1, \rho_{EW} = 1.$$

and for each firm by (36) have no real effect. Under the condition of indexed assets and liabilities of the central bank, the interest rate is completely independent of nominal changes – it is the fixed star of the economic firmament.

7.6 Concrete consequences from abstract analysis

Separation of the transaction and credit function

The central bank stands here for the whole banking industry which consists normally of the central bank and commercial banks and a host of specialized financial firms. The boiling down of the banking industry to the central bank simplifies matters considerably because there is no need to deal with the fractional reserve system and the interactions within the banking industry. These practical details are not forgotten but can be reintroduced at any time.

While loan/debt emerge gradually from pure transactions and are closely intertwined as shown in Figure 6 there are great differences between the transaction and the credit function of the banking industry. Clearly, the transaction function is fundamental. We can imagine an elementary consumption economy without loan/debt ever occurring but not without the daily transactions between the household and the business sector.

It is extremely important that the transaction medium adapts perfectly to the transaction needs of the household and business sector. For example, if the business sector decides to double employment at the going wage rate there is absolutely no argument against doubling the transaction balances. Quite the contrary, historically the quantitative fixity of the transaction medium has always stifled real growth. The creation of many variants of near money was the awkward solution to this problem. Under the condition that the transaction unit of the central bank adapts perfectly to the transactions needs there is no compensatory need for near moneys.

The perfect adaption to the autonomous transaction needs is, of course, not inflationary. The central bank does not throw money into the economy. According to (34) there is no such thing as a fix causality from transaction money to price – the dependency is formally exactly the other way round. Hence, when the wage rate

doubles the market clearing price doubles according to (13) and the transaction balances double according to (27). Thus, one gets an observable one-to-one correlation between the average stock of transaction money and price but this has nothing to do with causality. Notice, that the quantity of money at period beginning and end is always zero according to (25). There has always been something deeply wrong with the commonplace Quantity Theory (2011a; 2011b).

Money transactions are a service of the transaction unit that fetches a price just like any other good or service. Evidently, this has not necessarily anything to do with credit and interest. Let us assume that both functions are organizationally perfectly separated. This has two merits. First, the transactions are not affected by monetary policy. For example, if the central bank increases the interest rate in order to curb new lending this has no effect on the ongoing monetary transactions between household and business sector. Clearly, there is no intrinsic relationship between the buying of bread and milk and interest. These are entirely separate things. Second, if the banking unit gets in serious trouble because of credit defaults this does not affect ongoing transactions. It is indeed very important to shield the transaction part of the banking industry from the rest because nothing brings an economy faster down than disturbances of daily monetary transactions. There is absolutely no reason why disturbances in the credit part of the banking industry, which involves risk, carries over to the transaction part, which involves, depending on organizational sophistication, not much or an entirely different kind of risk. There is no need to mix operational and credit risk. Basically, the transaction and the credit sphere run on different principles. What they have in common is that money is created out of nothing. But to produce transactions or to produce loans are entirely different economic activities.

Indexing of the central bank's balance sheet

The principle of the neutrality of money simply demands indexing. The historically given fixity of nominal credit/debt is a distortion that makes itself felt in the difference between nominal and real interest. In a neutral money order the rate of interest depends alone on the productivity of the banking unit according to (42) and is not at all affected by inflation or deflation. There is no such thing as a real balance effect.

A doubling of the nominal variables wage rate and price does not affect the interest rate if both sides of the central bank's balance sheet are properly indexed. The rate of interest is *ab ovo* a real magnitude. From the viewpoint of theoretical economics the historically given monetary order is evolutionary flub that has eventually to be repaired. The neutrality of money – properly understood – involves that a doubling of all nominal variables leaves the interest rate entirely unaffected.

It should be clear that all the gospels of conventional monetary policy, which are by and large derivatives of the commonplace Quantity Theory, do no longer apply in a functionally perfect monetary order. The Quantity Theory in turn was never much

more than a flat-earth hypothesis with much appeal to commonsensers, of which there has always been an overabundance in economics.

8 Defect #6 Doomed to growth

The business sector is now split into the consumption good and the investment good industry. Each industry consists of one firm (for more details see 2011d). The income equation (1) then changes to:

$$Y = \underbrace{W_C L_C + W_I L_I}_{Y_W} + \underbrace{D_C N_C + D_I N_I}_{Y_D}. \quad (45)$$

Profit of the consumption good industry is given analogously to (16) by:

$$Q_{mC} \equiv C - W_C L_C. \quad (46)$$

By the same token is profit for the investment good industry given by:

$$Q_{mI} \equiv I - W_I L_I. \quad (47)$$

The period profits of both industries sum up to:

$$Q_m \equiv Y_D + I - S_m \quad (48)$$

$$\text{with } S_m \equiv Y - C.$$

Total monetary profit of the business sector increases with profit distribution Y_D and increasing investment expenditures I and decreases with monetary saving S_m . Eq. (48) compares to (17).

The Profit Law for the investment economy reads:

$$Q_m \equiv \left(\rho_{EC} + \rho_{EI} - \frac{1}{1 + \rho_D} \right) Y \quad (49)$$

$$\text{with } \rho_{EC} \equiv \frac{C}{Y}, \rho_{EI} \equiv \frac{I}{Y}.$$

Profit depends on the consumption and investment expenditure ratio and the distributed profit ratio. Total income is the scale factor. In the special case $\rho_E = \rho_{EC} + \rho_{EI} = 1$ monetary profit depends alone on distributed profit. The special case entails that the investment expenditure ratio goes up if the consumption

expenditure ratio goes down and vice versa. This does not happen spontaneously, of course, but is an important analytical limiting case. In the real world the overall expenditure ratio ρ_E is always different from unity. Eq. (49) compares to (18). The simpler version is a special cases of the Profit Law for the investment economy (49).

Put simply, $\rho_E > 1$ contributes to profit as well as $\rho_I > 0$ and $\rho_D > 0$. Let us take as the normal case that the household sector saves, i.e. $\rho_E < 1$. Now, for simplicity, it is assumed that the effect of saving and profit distribution cancel exactly out, then in (49) there remains only $\rho_I > 0$ as a source of overall profit. This means that there must be a minimum growth – expressed as investment expenditure – thus that overall profit remains above the structural minimum which in turn depends on structural inhomogeneity. The inhomogeneity may be greater or smaller in the course of time but it never vanishes.

Now, we know from Section 5 that profit must be above the structural minimum profit otherwise firms go bankrupt and unemployment increases. This happens even if the price system signals and works properly because the most perfect signaling does not help to avoid loss. Therefore, the market economy can only exist as growing system. This in turn leads to the problem that growth eventually runs against naturally given limits. There is no need to elaborate here on the well-known problems of resource depletion and environmental pollution. The first problem is a purely economical one, viz. how to turn on a steady state path without provoking immediate economic havoc. If ρ_I is set to zero the interplay of ρ_E and ρ_D has to be fine-tuned in order to bring the system onto a new and reproducible trajectory.

Growth has worked in the past as the problem solver and most of the time kept the economy spontaneously above the structural minimum profit (2014b). The Invisible Hand has done a good job and most economists thought all this was due to allocative efficiency. Once more, allocative efficiency has nothing to do with overall profit. If overall profit goes to zero the economy evaporates no matter how efficient or inefficient it actually is. Because the representative economist has no idea of how the monetary economy works he cannot tell how a soft landing could be engineered before the system hits the natural entropy wall. There is no self-stabilizing mechanism in the market economy that ensures that overall profit remains safely above the structurally given minimum profit. It is the profit mechanism that is decisive for overall stability, and profit in turn is according to (49) linked to growth, deficit spending, and profit distribution. Growth is, in the first place, not needed to increase wealth but to fend off loss, bankruptcy, and unemployment.

9 Defect #7 The querulent employment mechanism

The structural axioms are free of any assumptions about causality or functional dependency. We now explicitly add the assumption that employment is the dependent variable in an economy that is composed of a consumption good producing firm

and an investment good producing firm. The conditional flexibility of the market clearing price applies no longer; the price P is now set independently by the business sector.

As in Section 8 the business sector is split into the two industries. Accordingly, total employment is defined by:

$$L \equiv L_C + L_I. \quad (50)$$

This changes the 1st axiom to:

$$Y = \underbrace{W_C L_C + W_I L_I}_{Y_W} + \underbrace{D_C N_C + D_I N_I}_{Y_D}. \quad (51)$$

Profits are given by:

$$\begin{aligned} Q_{mC} &\equiv C - W_C L_C \\ Q_{mI} &\equiv I - W_I L_I. \end{aligned} \quad (52)$$

From the differentiated equation (51) follows under the conditions of market clearing, zero distributed profit, and equal wage rates in both industries:

$$\begin{aligned} L &= \frac{1}{1 - \rho_E \rho_{FC}} \frac{I}{P_I R_I} \\ \text{if } \rho_{XC} &= 1, \rho_{XI} = 1, \rho_D = 0, W = W_C = W_I. \\ \text{with } \rho_E &\equiv \frac{C}{Y}, \rho_{FC} \equiv \frac{W}{P_C R_C} \end{aligned} \quad (53)$$

Employment depends on aggregate demand, i.e. on (i) ρ_E and (ii) investment expenditure I at given price and productivity in the investment good industry, as well as on (iii) the configuration of (average) wage rate, price, and productivity, i.e. on the factor cost ratio ρ_{FC} in the consumption good industry. In more detail this means:

- An increase of the (average) wage rate W leads to *higher* employment. This follows directly from the interdependence of markets and this is exactly the opposite of what commonplace behavioral speculation assumes. The orthogonal interdependence of the product and labor market has been dealt with in Section 3.
- Price increases are conducive to *lower* employment. This explains stagflation.

- Provided that wage rate and price in the consumption good industry change with the same rate ($\ddot{W}_C = \ddot{P}_C$ and $\ddot{R}_C = 0$ in (53)) there is no effect on employment. In this case, perfect wage-price flexibility has no impact on employment. This explains inertia at the current unemployment rate.
- An increase of the expenditure ratio ρ_E leads to higher employment. An expenditure ratio $\rho_E > 1$, i.e. credit expansion, presupposes the existence of a banking system (for details see 2015b).
- Productivity increases lead to lower employment.
- Investment expenditures I exert a positive influence on employment.

The variable that is of heightened interest is the factor cost ratio ρ_F . This variable is entirely missing, for example, in Keynes's employment theory and this is why it does not work under the condition of inflation or deflation. The factor cost ratio stands for the price mechanism. This mechanism should – according to economists' claims since the Classics – bring about full employment, yet it does not. On this point Keynes was correct, albeit only phenomenologically, because he, too, did not really understand how the monetary economy works (2012).

With the inclusion of profit distribution the employment equation becomes a bit longer but not substantially different from the simpler version (53):

$$L = \frac{1}{1 - \rho_E \rho_{FC}} \left(\frac{I}{P_I R_I} + \frac{\rho_E Y_D}{P_C R_C} \right) \quad (54)$$

$$\text{if } \rho_{XC} = 1, \rho_{XI} = 1, W = W_C = W_I.$$

In addition to the factors enumerated above profit distribution exerts a positive influence on employment. This factor has been completely overlooked by both Keynes and the Classics. The reason is that both lacked the correct profit theory.

About the role of aggregate demand for employment eq. (54) says roughly the same as Keynes said, under the condition that the factor cost ratios are fixed. That means that Keynes's approach deals with a special case and ultimately does not live up to the claim of generality.

The crucial point, though, is the complete misapprehension of the role of the price mechanism and the interdependence of markets. Most economists share the belief that a falling wage rate would – in principle – help to clear the labor market. Exactly the opposite is true.

The fact of the matter is that an increase of the wage rate relative to the price *increases* employment under the condition of market clearing in the product market. The fatal defect of the price mechanism is that the 'right' factor cost ratios do not come about spontaneously. Just the contrary. If unemployment effects a flexible fall

in the average wage rate then unemployment *increases*. There is a *positive* feedback loop built right into the structural core of the system. The claim that the market system is basically an equilibrium system that regulates itself with a tendency to some natural unemployment (in more sanguine times called full employment) is entirely unfounded.

10 Defect #8 The distribution mechanism

The share of the total quantity bought that wage earners absorb in the pure consumption economy with a given expenditure ratio at a given price is defined as (for details see 2014c):

$$\delta_W \equiv \frac{\rho_E \frac{Y_W}{P}}{X} \equiv \frac{1}{1 + \rho_D} \quad (55)$$

if $\rho_X = 1$.

Since the quantity bought X , which by assumption $\rho_X = 1$ is equal to output O , the share δ_W is identical with the share of output. This share depends solely on the distributed profit ratio ρ_D . The higher the distributed profit ratio the lower the real share of the wage income receivers.

Analogously, the real share of the receivers of distributed profit is given by:

$$\delta_D \equiv \frac{\rho_E \frac{Y_D}{P}}{X} \equiv \frac{\rho_D}{1 + \rho_D}. \quad (56)$$

Both shares add up to unity:

$$\delta_W + \delta_D = 1. \quad (57)$$

The division of output between the two income categories depends solely on the distributed profit ratio ρ_D . Profits do not have any impact. An increase of profits without a simultaneous increase in distributed profits therefore has no effect on the real situation of the wage earners taken as a whole. If profits are always retained in full, i.e. $\rho_D = 0$, then total output goes to the wage income recipients. The fact that profit is greater than zero because of $\rho_E > 1$ has no effect on the real share of wage earners *as a whole*. It does have an effect on the distribution of output *among* the wage earners.

The distributed profit ratio has already been defined with (9) as:

$$\rho_D \equiv \frac{DN}{WL} \equiv \frac{Y_D}{WL} \equiv \frac{Y_D}{Y_W} \quad (58)$$

If distributed profits Y_D stay the same and the wage rate or employment increases then the distributed profit ratio falls and the distribution of the output changes according to (55) in favor of the wage earners. The real shares of output correspond to the relation of the nominal magnitudes distributed profit income Y_D and wage income Y_W that is expressed by the ratio ρ_D if the expenditure ratio ρ_E for both income categories is identical. Wage rate and employment variations have no effect on the real shares if the dividend D moves in step with the wage rate W and if the number of shares N moves in step with employment L . In this case ρ_D remains constant throughout and by consequence the real shares remain constant, too.

In general, the expenditure ratio is not identical for spending out of wage income and spending out of distributed profit income. When the recipients of wage income and distributed profits belong to two separate groups with different spending behavior the general definition of the expenditure ratio is given as the weighted average of the groups' individual expenditure ratios:

$$\rho_E \equiv \rho_E^W \frac{Y_W}{Y} + \rho_E^D \frac{Y_D}{Y}. \quad (59)$$

The definition of the real share of the wage income recipients changes accordingly when in (55) the average expenditure ratio ρ_E is replaced by the group-specific expenditure ratio:

$$\delta_W \equiv \frac{\rho_E^W \frac{Y_D}{P}}{X} \equiv \frac{\rho_E^W}{\rho_E^W + \rho_E^D \rho_D}. \quad (60)$$

Analogously, the real share of the receivers of distributed profit is then given by:

$$\delta_D \equiv \frac{\rho_E^D \rho_D}{\rho_E^W + \rho_E^D \rho_D}. \quad (61)$$

Both shares add up to unity:

$$\delta_W + \delta_D = 1. \quad (62)$$

Hence, in general the real shares are determined by the distributed profit ratio ρ_D and the spending pattern of both income groups. With a higher distributed profit ratio and more spending out of distributed profits the real share of the wage earners shrinks. And vice versa, a higher ratio of retained profit and more saving out of distributed profit increases the real share of wage earners. If the spending out of

distributed profit is zero, i.e. $\rho_E^D = 0$, the wage earners absorb the whole output independently of what the distribution of nominal incomes looks like.

Let us assume, in analogy to Kalecki's famous prototype, that wage income is fully spent and distributed profit is fully saved. Then (59) turns to:

$$\rho_E = \frac{Y_W}{Y} \Rightarrow \rho_E < 1. \quad (63)$$

According to (18) this means that total profit is exactly zero. However, this in turn means that there is distributed profit but no profit. This is possible for some periods but not for a longer time span. From (59) follows the condition:

$$\rho_E = \rho_E^W \frac{Y_W}{Y} = 1 \quad (64)$$

if $\rho_E^D = 0$.

and this means that $\rho_E^W > 1$, that is, the dissaving of the wage income receivers must compensate the saving of the distributed profit receivers, such that profit and distributed profit is equal. This reproducible configuration implies that the wage income receivers continually increase their overdrafts while the distributed profit receivers continually increase their deposits. Total financial wealth is zero but it is rather unevenly distributed between financial assets and liabilities.

It cannot be said *a priori* how long this reproducible but precarious configuration could last. However, as long as it lasts it changes the distribution of wealth. The savers accumulate deposits, which may eventually take the form of bonds, shares or other financial assets, and the dissavers accumulate overdrafts or other forms of debt. This in turn makes it necessary to take interest on financial assets and liabilities into the picture (for details see 2015a).

In the simplest case, the respective expenditure ratios are unity. In this case eqs. (55) and (56) apply, that is, the distribution of the real product is solely governed by the distributed profit ratio ρ_D and wealth remains unaltered because there is neither saving nor dissaving. This means that the real shares of output are determined in the spheres of income and expenditures and not, as economists have maintained since the Classics, in the sphere of production. Accordingly, the real wage follows from (12) as:

$$\frac{W}{P} = \frac{R}{\rho_E (1 + \rho_D)} \quad (65)$$

if $\rho_X = 1$.

The real wage rises with productivity and falls with an increase of the expenditure ratio and/or the distributed profit ratio. Since there is no capital in the pure consumption economy the real wage cannot have anything to do with the marginal

productivity of capital. It has nothing to do with the marginal productivity of labor either. The real wage is a *structural* fact. Distribution is neither dependent on an imaginary production function with convenient properties nor on the behavioral assumption of profit maximization. The marginalistic theory of distribution always has been of inexpressible ridiculousness.

The distribution of period output is governed by the distributed profit ratio ρ_D and the respective expenditure ratios. Changes in the distribution of wealth are governed by the expenditure ratio which determines the quantity of financial wealth (for details see 2015a). This holds for the simple case of the pure consumption economy. When we turn to the investment economy the distribution formulas become a bit more complex but the fundamental relationships remain unchanged. The distribution of real output and financial/real wealth has nothing at all to do with performance or productivity, it is in the main governed by the interaction of profit and distributed profit which constitutes a positive feedback loop that leads in the longer run qua self-reinforcement to a concentration of financial/real wealth.

11 Conclusion

Orthodoxy as well as Heterodoxy are based on plausible but ultimately unacceptable premises. These are in the present paper replaced by objective-structural axioms.

Having secured the correct formal starting point the subsystems of the consumption and investment economy are consistently reconstructed with a view on functional defects. The main results of the systemic analysis are:

- The crucial systemic fact is: when the product price is determined in the elementary economy by ‘supply and demand’ in the product market then the real wage cannot be determined by ‘supply and demand’ in the labor market. Because of this, the general assertion that all markets are cleared by the price mechanism is false.
- The crucial point is that profit for the economy as a whole cannot be derived from the behavior of the individual firm. That is, the standard microeconomic approach cannot, as a matter of principle, deliver the correct profit theory. The familiar stories about the working of the profit mechanism are false since Adam Smith.
- There is no spontaneous mechanism in the market system which ensures that total profit is always at least equal to the structural minimum profit. From the top-level perspective the market system is not self-regulating.
- Because all combinations of direct and indirect labor input in the elementary consumption economy are profit neutral for the business sector as a whole,

there is no optimal point to choose and no built-in mechanism that establishes overall allocative efficiency. The elementary consumption economy is reproducible at any level of inefficiency because overall profit does not depend on productivity or efficiency.

- Under the condition that the transaction unit of the central bank adapts perfectly to the transactions needs there is no compensatory need for near moneys. The perfect adaption is not inflationary. Money transactions are a service of the transaction unit that fetches a price just like any other good or service. This has nothing to do with credit and interest. The transaction and the credit sphere run on different principles. What they have in common is that money is created out of nothing. But to produce transactions or to produce loans are entirely different economic activities.
- The principle of the neutrality of money simply demands indexing. The historically given fixity of nominal credit/debt is a distortion that makes itself felt in the difference between nominal and real interest. In a neutral money order the rate of interest depends alone on the productivity of the banking unit and is not at all affected by inflation or deflation. There is no such thing as a real balance effect.
- There is no self-stabilizing mechanism in the market economy that ensures that overall profit remains safely above the structurally given minimum profit. It is the profit mechanism that is decisive for overall stability, and profit in turn is linked to growth, deficit spending, and profit distribution. Growth is, in the first place, not needed to increase wealth but to fend off loss, bankruptcy, and unemployment.
- An increase of the wage rate relative to the price increases employment under the condition of market clearing in the product market. The fatal defect of the price mechanism is that the 'right' factor cost ratios do not come about spontaneously. Just the contrary. If unemployment effects a flexible fall in the average wage rate then unemployment increases. There is a positive feedback loop built right into the structural core of the system.
- The distribution of period output is governed by the distributed profit ratio and the respective expenditure ratios. Changes in the distribution of wealth are governed by the expenditure ratio which determines the quantity of financial wealth. The distribution of real output and financial/real wealth has nothing at all to do with performance or productivity, it is in the main governed by the interaction of profit and distributed profit which constitutes a positive feedback loop that leads in the longer run qua self-reinforcement to a concentration of financial/real wealth.

From the methodological standpoint Walrasianism, Keynesianism, and Austrianism is unacceptable, albeit for different reasons. What unites them is that neither

approach can explain how the market system works. There is still some real danger that these obsolete approaches induce counterproductive economic policy measures.

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